

CLAIMS

We claim:

1. A pump control and management system comprising:
a sump pump adapted for pumping water out of a sump pit;
a level sensing assembly positioned within the sump pit for detecting a level of water in the sump pit, and
a control assembly operationally coupled to said sump pump, said control assembly being operationally coupled to said level sensing assembly, said control assembly activating said sump pump when said level sensing assembly signals that water in the sump pit has reached a predetermined level.
2. The system of claim 1, wherein said control assembly being electrically coupled between an electrical service connection and said sump pump, said control assembly monitoring electrical current drawn by said sump pump.
3. The system of claim 2, wherein said control assembly detects a locked rotor of said sump pump when the electrical current drawn from the electrical service connection exceeds a predetermined threshold, said control assembly attempts to free the locked rotor by repeatedly applying electrical current to said sump pump to jog the rotor a predetermined number of times, said control assembly providing a user alarm if the attempt to free the locked rotor fails.

4. The system of claim 1, wherein said control assembly periodically performs diagnostic tests of said sump pump to determine operability of said sump pump, said diagnostic tests includes periodic activation of said sump pump and monitoring of current drawing by said sump pump, no current being drawn indicating an open motor or electrical connection failure, initial high current consumption indicating potential binding of an impeller of said sump pump, continuous high current indicating a locked rotor, said control assembly providing a user alarm for each one of no current, initial high current, and continuous high current results of said diagnostic tests.

5. The system of claim 1, wherein said level sensing assembly comprises a plurality of thermistors positioned in the sump pit, each one of said plurality of thermistors changing resistance when in contact with water whereby the level of water in the sump pit is determinable.

6. The system of claim 5, wherein said control assembly monitors a resistance value associated with each one of said plurality of thermistors, said control assembly providing a user alarm upon any one of said plurality of thermistors having a resistance value outside of a predetermined range.

7. The system of claim 1, further comprising at least one local sensor for detecting a water level outside of the sump pit, said local sensor being operationally coupled to said control assembly.

8.. The system of claim 7, wherein said control assembly monitors a resistance value associated with said at least one local sensor, said control assembly providing a user alarm upon any one of said at least one local sensor having a resistance value outside of a predetermined range.

9. A pump control and management system comprising:
a sump pump adapted for pumping water out of a sump pit;
a level sensing assembly positioned within the sump pit for detecting a level of water in the sump pit, and
a control assembly being electrically coupled between an electrical service connection and said sump pump, said control assembly monitoring electrical current drawn by said sump pump, said control assembly being operationally coupled to said level sensing assembly, said control assembly activating said sump pump when said level sensing assembly signals that water in the sump pit has reached a predetermined level, said control assembly periodically performs diagnostic tests of said sump pump to determine operability of said sump pump, said diagnostic tests includes periodic activation of said sump pump and monitoring of current drawing by said sump pump, no current being drawn indicating an open motor or electrical connection failure, initial high current consumption indicating potential binding of an impeller of said sump pump, continuous high current indicating a locked rotor, said control assembly providing a user alarm for each one of no current, initial high current, and continuous high current results of said diagnostic tests, said control assembly attempts to free the locked rotor by repeatedly applying electrical current to said sump pump to jog the rotor a predetermined number of times, said control assembly providing a user alarm if the attempt to free the locked rotor fails;

wherein said level sensing assembly comprises a plurality of thermistors positioned in the sump pit, each one of said plurality of thermistors changing resistance when in contact with water whereby the level of water in the sump pit is determinable; and

at least one local sensor for detecting a water level outside of the sump pit, said local sensor being operationally coupled to said control assembly.

10. The system of claim 9, further comprising:

a secondary level detection assembly for detecting water overflowing from the sump pit, said secondary level detection assembly being operationally coupled to said control assembly; and

a secondary pump operationally coupled to said control assembly, said secondary pump being activated when said secondary level detection assembly detects a fluid above a predetermined secondary level.

11. The system of claim 10, wherein said control assembly monitors a resistance value associated with said secondary level detection assembly, said control assembly providing a user alarm upon said secondary level detection assembly having a resistance value outside of a predetermined range.

12. The system of claim 9, further comprising a modem operationally coupled to said control assembly, said modem being couplable to a conventional telephone system, said modem being for dialing out on the conventional telephone system to relay an alarm condition from said control assembly to a remote location.

13. The system of claim 12, further comprising a backup battery system for providing electrical power to said control assembly and said modem in the event of electrical failure whereby said alarm condition from said control assembly may be relayed during power failure.

14. The system of claim 12, wherein said modem relays at least one of a plurality of predetermined voice messages associated with said alarm condition whereby a person listening at the remote location can determine the alarm condition.

15. The system of claim 9, wherein said control assembly further comprises a generator control assembly for selectively signaling an electrical generator to start in the event of a power failure, said control assembly being operationally coupled to an output of the generator for facilitating routing of electrical power from the electrical generator.

16. The system of claim 9, wherein said control assembly further comprises a computer interface for operationally coupling said control assembly to a conventional computer whereby data may be exchanged between said control assembly and the conventional computer.

17. The system of claim 16, wherein said computer interface further includes a power line modem for routing data over existing in-situ power lines thereby decreasing a need for custom wiring of the system for installation.

18. The system of claim 9, further comprising a flood detection assembly operationally coupled to said control assembly, said flood detection assembly detecting rising flood waters and signaling said control assembly, said flood detection assembly detecting receding flood water and signaling said control assembly.

19. The system of claim 9, further comprising an information display panel operationally coupled to said control assembly, said information display panel including a strobe light for providing a visual indication of an alarm condition, said information display panel including a speaker for providing an aural indication of an alarm condition, said information display panel including a display output for providing a visual representation of an system status and alarm condition, said information display panel including a keyboard assembly for facilitating data input into said system by a user.

20. The system of claim 9, further comprising a sewage ejector interface system including a sewage level detection assembly operationally coupled to said control assembly, said sewage level detection assembly indicating at least a stop level detection, a start level detection, and a high level alarm detection, said sewage ejector interface system including at least one sewage ejector pump interface for selectively controlling operation of a sewage ejection pump.

21. The system of claim 20, wherein said control assembly monitors a resistance value associated with said sewage level detection assembly, said control assembly providing a user alarm upon said sewage level detection assembly having a resistance value outside of a predetermined range.

22. The system of claim 9, wherein said at least one local sensor further comprises:

- a water heater leak sensor operationally coupled to said control assembly for sensing a leak from a conventional water heater;

- a laundry leak sensor operationally coupled to said control assembly for sensing a leak from a conventional washing machine;

- a dishwasher leak sensor operationally coupled to said control assembly for sensing a leak from a conventional dishwasher;

- a sink leak detector operationally coupled to said control assembly for sensing a leak from a conventional sink;

- a bathroom leak detector operationally coupled to said control assembly for sensing a water leak in a bathroom;

- a pool sensor operationally coupled to said control assembly for detecting a high water level in pool;

- a septic system sensor operationally coupled to said control assembly for detecting a high level in a septic system;

said control assembly generating an alarm uniquely associated with each one of said water heater leak sensor, said laundry leak sensor, said a dishwasher leak sensor, said sink leak detector, said bathroom leak detector, said pool sensor, and said septic system sensor, said control assembly activating a solenoid to shut off a water supply when said alarm is generated.

23 The system of claim 5, wherein said control assembly monitors a resistance value associated with each one of said at least one local sensor, said control assembly providing a user alarm upon any one of said at least one local sensor having a resistance value outside of a predetermined range.

24. The system of claim 9 further comprising a manual pump actuation assembly for providing a user with a means of actuating said sump pump on demand, said manual pump actuation assembly being operationally coupled to said control assembly.

25. The system of claim 9, further comprising at least one video camera operationally coupled to said control assembly, said video camera monitoring an area associated with at least one of said sensors, said video camera providing at least one image to be relayed through said modem to a remote location upon generation of an alarm associated with one of said sensors.

26. The system of claim 25, wherein a position of said at least one video camera being adjustable by said control assembly, said video camera tilting to change an area of monitoring when commanded by said control assembly, said video camera being panning when commanded by said control assembly to change an area of monitoring.

27. The system of claim 26, wherein said control assembly commanding said at least one video camera to tilt upon receiving an instruction from a remote user via said modem and said control assembly commanding said at least one video camera to pan upon receiving an instruction from a remote user via said modem whereby positioning of said at least one video camera is controllable by a remote user.

28. The system of claim 9, further comprising a motion detection means for providing a supplemental signal to said control assembly, said supplemental signal being used to alert a user.

29. The system of claim 28, wherein said motion detection means further comprises:

at least one video camera being adjustable by said control assembly, said video camera tilting to change an area of monitoring when commanded by said control assembly, said video camera being panning when commanded by said control assembly to change an area of monitoring;

a video motion detector operationally coupled to said at least one video camera to determine an occurrence of motion based upon a video image from said at least one video camera.

30. The system of claim 29, wherein said motion detection means further comprises a video motion filter, said filter being capable of selecting a sub-area of said video image for determining the occurrence of motion, said filter being capable of selecting a threshold of motion necessary to generate said supplemental signal.

31. The system of claim 9, further comprising at least one audio transducer for selectively capturing ambient audio in an area to be monitored, said at least one audio transducer being operationally

coupled to said control assembly for providing a representation of the ambient audio to a user.

32. The system of claim 9, wherein said control assembly being remotely accessible by a remote user whereby said system may be controlled by the remote user.

33. The system of claim 32, wherein said control assembly being remotely accessible by the remote user through a dial-up connection operationally interacting with said modem, whereby the remote user may dial a telephone number associated with said modem and interact with said control assembly.

34. The system of claim 33, further comprising a password system for inhibiting unauthorized access to said control assembly through said dial-up connection.

35. The system of claim 32, wherein said control assembly being operationally coupled to an internet whereby said control assembly is accessible through an internet protocol (IP) address, whereby the remote user may access an internet page and interact with said control assembly.

36. The system of claim 35, further comprising a password system for inhibiting unauthorized access to said control assembly through said internet protocol (IP) address.

37. A pump control and management system comprising:
a sump pump adapted for pumping water out of a sump pit;
a level sensing assembly positioned within the sump pit for detecting a level of water in the sump pit, and

a control assembly being electrically coupled between an electrical service connection and said sump pump, said control assembly monitoring electrical current drawn by said sump pump, said control assembly being operationally coupled to said level sensing assembly, said control assembly activating said sump pump when said level sensing assembly signals that water in the sump pit has reached a predetermined level, said control assembly periodically performs diagnostic tests of said sump pump to determine operability of said sump pump, said diagnostic tests includes periodic activation of said sump pump and monitoring of current drawing by said sump pump, no current being drawn indicating an open motor or electrical connection failure, initial high current consumption indicating potential binding of an impeller of said sump pump, continuous high current indicating a locked rotor, said control assembly providing a user alarm for each one of no current, initial high current, and continuous high current results of said diagnostic tests, said control assembly attempts to free the locked rotor by repeatedly applying electrical current to said sump pump to jog the rotor a predetermined number of times, said control assembly providing a user alarm if the attempt to free the locked rotor fails;

wherein said level sensing assembly comprises a plurality of thermistors positioned in the sump pit, each one of said plurality of thermistors changing resistance when in contact with water whereby the level of water in the sump pit is determinable;

at least one local sensor for detecting a water level outside of the sump pit, said local sensor being operationally coupled to said control assembly

a secondary level detection assembly for detecting water overflowing from the sump pit, said secondary level detection assembly being operationally coupled to said control assembly; and

a secondary pump operationally coupled to said control assembly, said secondary pump being activated when said secondary

level detection assembly detects a fluid above a predetermined secondary level;

a modem operationally coupled to said control assembly, said modem being couplable to a conventional telephone system, said modem being for dialing out on the conventional telephone system to relay an alarm condition from said control assembly to a remote location;

a backup battery system for providing electrical power to said control assembly and said modem in the event of electrical failure whereby said alarm condition from said control assembly may be relayed during power failure;

wherein said modem relays at least one of a plurality of predetermined voice messages associated with said alarm condition whereby a person listening at the remote location can determine the alarm condition;

said control assembly further comprises a generator control assembly for selectively signaling an electrical generator to start in the event of a power failure, said control assembly being operationally coupled to an output of the generator for facilitating routing of electrical power from the electrical generator;

said control assembly further comprises a computer interface for operationally coupling said control assembly to a conventional computer whereby data may be exchanged between said control assembly and the conventional computer;

said computer interface further includes a power line modem for routing data over existing in-situ power lines thereby decreasing a need for custom wiring of the system for installation;

a flood detection assembly operationally coupled to said control assembly, said flood detection assembly detecting rising flood waters and signaling said control assembly, said flood detection assembly detecting receding flood water and signaling said control assembly;

an information display panel operationally coupled to said control assembly, said information display panel including a strobe light for providing a visual indication of an alarm condition, said information display panel including a speaker for providing an aural indication of an alarm condition, said information display panel including a display output for providing a visual representation of an system status and alarm condition, said information display panel including a keyboard assembly for facilitating data input into said system by a user;

a sewage ejector interface system including a sewage level detection assembly operationally coupled to said control assembly, said sewage level detection assembly indicating at least a stop level detection, a start level detection, and a high level alarm detection, said sewage ejector interface system including at least one sewage ejector pump interface for selectively controlling operation of a sewage ejection pump; and

a manual pump actuation assembly for providing a user with a means of actuating said sump pump on demand, said manual pump actuation assembly being operationally coupled to said control assembly.

38. The system of claim 37, further comprising:

at least one video camera operationally coupled to said control assembly, said video camera monitoring an area associated with at least one of said sensors, said video camera providing at least one image to be relayed through said modem to a remote location upon generation of an alarm associated with one of said sensors;

wherein a position of said at least one video camera being adjustable by said control assembly, said video camera tilting to change an area of monitoring when commanded by said control assembly, said video camera being panning when commanded by said control assembly to change an area of monitoring;

said control assembly commanding said at least one video camera to tilt upon receiving an instruction from a remote user via said modem and said control assembly commanding said at least one video camera to pan upon receiving an instruction from a remote user via said modem whereby positioning of said at least one video camera is controllable by a remote user;

a video motion detector operationally coupled to said at least one video camera to determine an occurrence of motion based upon a video image from said at least one video camera; and

a video motion filter being capable of selecting a sub-area of said video image for determining the occurrence of motion, said filter being capable of selecting a threshold of motion necessary to generate a supplemental signal.

39. The system of claim 37, further comprising at least one audio transducer for selectively capturing ambient audio in an area to be monitored, said at least one audio transducer being operationally coupled to said control assembly for providing a representation of the ambient audio to a user.

40. The system of claim 37, further comprising:

said control assembly being remotely accessible by the remote user through a dial-up connection operationally interacting with said modem, whereby the remote user may dial a telephone number associated with said modem and interact with said control assembly; and

a password system for inhibiting unauthorized access to said control assembly through said dial-up connection.

41. The system of claim 37, further comprising:

wherein said control assembly being remotely accessible by a remote user through a remote connection means whereby said system may be controlled by the remote user;

said remote connection means being selected from the group of remote connection means consisting of a dial-up connection operationally interacting with said modem, and an internet protocol (IP) address; and

a password system for inhibiting unauthorized access to said control assembly through said remote connection means.

42. The system of claim 37, further comprising:

at least one video camera operationally coupled to said control assembly, said video camera monitoring an area associated with at least one of said sensors, said video camera providing at least one image to be relayed through said modem to a remote location upon generation of an alarm associated with one of said sensors;

wherein a position of said at least one video camera being adjustable by said control assembly, said video camera tilting to change an area of monitoring when commanded by said control assembly, said video camera being panning when commanded by said control assembly to change an area of monitoring;

said control assembly commanding said at least one video camera to tilt upon receiving an instruction from a remote user via said modem and said control assembly commanding said at least one video camera to pan upon receiving an instruction from a remote user via said modem whereby positioning of said at least one video camera is controllable by a remote user;

a video motion detector operationally coupled to said at least one video camera to determine an occurrence of motion based upon a video image from said at least one video camera;

a video motion filter being capable of selecting a sub-area of said video image for determining the occurrence of motion, said filter being capable of selecting a threshold of motion necessary to generate a supplemental signal;

at least one audio transducer for selectively capturing ambient audio in an area to be monitored, said at least one audio transducer being operationally coupled to said control assembly for providing a representation of the ambient audio to a user;

wherein said control assembly being remotely accessible by a remote user through a remote connection means whereby said system may be controlled by the remote user;

said remote connection means being selected from the group of remote connection means consisting of a dial-up connection operationally interacting with said modem, and an internet internet protocol (IP) address; and

a password system for inhibiting unauthorized access to said control assembly through said remote connection means.

43. The system of claim 37, further comprising:

wherein said control assembly monitors a resistance value associated with each one of said level sensing assembly, said at least one local sensor, said secondary level detection assembly, said sewage level detection assembly, and said flood detection assembly;

said control assembly providing a user alarm upon any one of said plurality of said level sensing assembly, said at least one local sensor, said secondary level detection assembly, said sewage level detection assembly, and said flood detection assembly having a resistance value outside of a predetermined range.